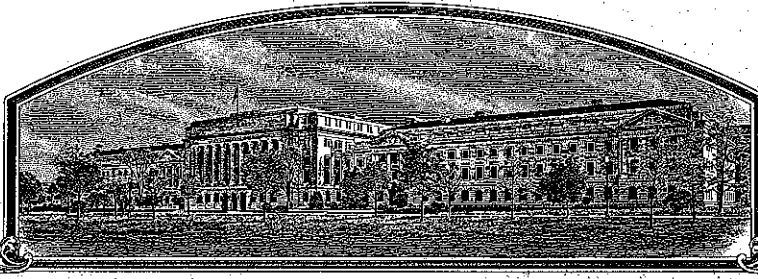


No.

200600005



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

U.S. Government, as represented by the Secretary of Agriculture

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSES, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMERICAL GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, COMMON

'Waxy-Pen'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this fifth day of June, in the year two thousand and six.

Attest:


Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

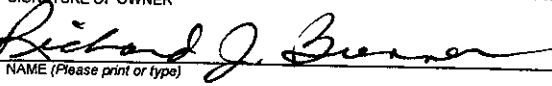

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

| | | | | | |
|---|--|--|--|---|--|
| 1. NAME OF OWNER US Government as represented by the Secretary of Agriculture | | 2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME WA7995 WQL7PENWX-2 | | 3. VARIETY NAME Ponawawa-X 'Waxy-Pen' MAH 518-06 | |
| 4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) USDA-ARS, Wheat Quality Lab E-202 Food Quality Building, WSU PO Box 646394 Pullman, WA 99164-6394 | | 5. TELEPHONE (include area code) (509) 335-4062 | | FOR OFFICIAL USE ONLY PVPO NUMBER 200600005 FILING DATE October 7, 2005 | |
| 6. FAX (include area code) (509) 335-8537 | | 7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) US Government | | | |
| 8. IF INCORPORATED, GIVE STATE OF INCORPORATION na | | 9. DATE OF INCORPORATION | | | |
| 10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) | | | | FILING AND EXAMINATION FEES: \$ 3652.00 DATE 10/7/2005 CERTIFICATION FEE: \$ 768.00 DATE 5/17/2006 | |
| 11. TELEPHONE (include area code) (509) 335-4062 | | 12. FAX (include area code) (509) 335-8537 | | 13. E-MAIL morrisc@mail.wsu.edu | |
| 14. CROP KIND (Common Name) Wheat | | 16. FAMILY NAME (Botanical) Poaceae | | 18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION. | |
| 15. GENUS AND SPECIES NAME OF CROP Triticum aestivum | | 17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO | | 20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act) <input checked="" type="checkbox"/> YES (If "yes", answer items 21 and 22 below) <input type="checkbox"/> NO (If "no", go to item 23) | |
| 19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) | | | | 21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED | |
| a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety | | | | 22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.) | |
| b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness | | | | | |
| c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety | | | | | |
| d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) | | | | | |
| e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership | | | | | |
| f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) | | | | | |
| g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$3,652), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office) | | see AD-672 | | | |
| 23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.) | | 24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.) | | | |
| 25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties. | | | | | |
| SIGNATURE OF OWNER  | | SIGNATURE OF OWNER | | | |
| NAME (Please print or type) Dr. Richard J. Brenner | | NAME (Please print or type) | | | |
| CAPACITY OR TITLE Assist. Admin. OTT | | DATE 16 Sept. '05 | | CAPACITY OR TITLE DATE | |

(See reverse for instructions and information collection burden statement)

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$3,652 (\$432 filing fee and \$3,220 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfiled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$432 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvpo/pvpindex.htm>

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that name has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, 10301 Baltimore Avenue, Suite 401 NAL Building, Beltsville, MD 20705. Telephone: (301) 504-5682 <http://www.ams.usda.gov/lsg/seed.htm>.

ITEM

- 19a. Give:
- (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
 - (2) the details of subsequent stages of selection and multiplication;
 - (3) evidence of uniformity and stability; and
 - (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
 - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
20. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

23. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

24. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

'Waxy-Pen'

200600005

PVP APPLICATION FOR ~~PENAWAWA-X~~ WHEAT VARIETY

MAH 5/18/06

EXHIBIT A: ORIGIN AND BREEDING HISTORY OF THE WHEAT

Penawawa-X has unique starch composition and end-use quality, and has potential for broad adaptation to U.S. Pacific Northwest environments. Penawawa-X is a fully-waxy (< 1% amylose), back-cross-five derivative of the soft white spring wheat variety 'Penawawa'. Penawawa (PI 495916; 'Potam 70' / 'Fielder') was developed by Dr. Calvin Konzak while at the Washington State University, Pullman, WA, and was released in 1985. Penawawa is null for the granule-bound starch synthase (GBSS) (Waxy) gene on chromosome 4A (genotype = *Wx-A1a*, *Wx-B1b*, *Wx-D1a*). The donor of the two additional GBSS null alleles (*Wx-A1b*, *Wx-D1b*) was the soft red spring wheat germ plasm line 'WQL6K107-BH WX 2-2a' (PI 612545), which has the pedigree: 'Kanto 107' / 'Bai Huo' (Kanto 107 is PI 631445, Bai Huo is PI 606717). Breeder seed of Penawawa-X was derived by bulking seed from 27 BC₅F₃-derived F₅ field plots grown near Bozeman, Montana in 2004. The BC₅F₃ plants were derived from 10 randomly-selected BC₅F₂ spikes which had been assayed for homozygous waxy trait using I₂/KI (stock solution of 0.1 M of each; working dilution in the range of 5-10 mM) on several kernels each. The kernels had a small portion of the distal brush end removed with a razor blade and the exposed endosperm was stained with iodine. Rust-colored, as opposed to dark purple color, was indicative of waxy starch. The waxy kernel trait was confirmed on the BC₅F₅ seed. Penawawa-X is indistinguishable from Penawawa except for the waxy kernel trait.

Penawawa-X has been observed for five generations of reproduction and during the seed increase period and is stable and uniform. No variants were observed.

EXHIBIT B: STATEMENT OF DISTINCTNESS

'Penawawa-X' is most similar to 'Penawawa'; however, 'Penawawa-X' has the waxy (zero percent amylose) kernel trait.

EXHIBIT B. Statement of Distinctness for 'Penawawa-X' 'Waxy-Pen'
in support of PVP Application No. 200600005, Wheat, Common; 5 May 2006

200600005

MAH 5/18/06

Specific genetic difference claim:

"Normal" 'Penawawa' has one null, and two functional Granule-Bound Starch Synthase genes and has the haplotype *Wx-A1a*, *Wx-B1b*, *Wx-D1a*.

'Penawawa-X' is null for all three Granule-Bound Starch Synthase genes and has the haplotype of *Wx-A1b*, *Wx-B1b*, *Wx-D1b*

REPRODUCE LOCALLY. Include form number and date on all reproductions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 2.5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Form Approved OMB NO 0581-0055

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

Exhibit C

OBJECTIVE DESCRIPTION OF VARIETY
Wheat (*Triticum* spp.)

| | | |
|--|---|---|
| NAME OF APPLICANT(S) Dr. Craig F. Morris | TEMPORARY OR EXPERIMENTAL DESIGNATION WA7996 WQL7PENWX-2 | VARIETY NAME Penawawa 'Waxy-Pen' ^{MAH} 5/18/06 |
| ADDRESS (Street and No. or RD No., City, State, Zip Code and Country) USDA-ARS E-202 Food Quality Bldg., WSU Pullman, WA 99164-6394 | | FOR OFFICIAL USE ONLY PVPO NUMBER 200600005 |

PLEASE READ ALL INSTRUCTIONS CAREFULLY:

Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g., or) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: _____ . Please answer all questions for your variety; lack of response may delay progress of your application.

1. KIND:

- 1 = Common
2 = Durum
3 = Club
4 = Other (Specify) _____

2. VERNALIZATION:

- 1 = Spring
2 = Winter
3 = Other (Specify) _____

3. COLEOPTILE ANTHOCYANIN:

- 1 = Absent 2 = Present

4. JUVENILE PLANT GROWTH:

- 1 = Prostrate 2 = Semi-erect 3 = Erect

5. PLANT COLOR: (boot stage)

- 1 = Yellow-Green
2 = Green
3 = Blue-Green

6. FLAG LEAF: (boot stage)

- 1 = Erect 2 = Recurved
 1 = Not Twisted 2 = Twisted
 1 = Wax Absent 2 = Wax Present

7. EAR EMERGENCE:

- Number of Days (Average)
 Number of Days Earlier Than * _____
Same As * Penawawa
 Number of Days Later Than * _____
*Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial

8. ANTHOR COLOR:

- 1 = Yellow 2 = Purple

9. PLANT HEIGHT: (from soil to top of head, excluding awns)

cm (Average)

cm Taller Than

Same As

Penawawa

cm Shorter Than

10. STEM:

A. ANTHOCYANIN

1 = Absent 2 = Present

B. WAXY BLOOM

1 = Absent 2 = Present

C. HAIRINESS (last internode of rachis)

1 = Absent 2 = Present

D. INTERNODE

1 = Hollow

2 = Semi-solid

3 = Solid

Number of Nodes

E. PEDUNCLE

1 = Erect

2 = Recurved

3 = Semi-erect

cm Length

F. AURICLE

Anthocyanin:

1 = Absent

2 = Present

Hair:

1 = Absent

2 = Present

11. HEAD: (At Maturity)

A. DENSITY

1 = Lax

2 = Middense (Laxidense)

3 = Dense

B. SHAPE

1 = Tapering

2 = Strap

3 = Clavate

4 = Other (Specify)

C. CURVATURE

1 = Erect

2 = Inclined

3 = Recurved

D. AWNEDNESS

1 = Awnless

2 = Apically Awnletted

3 = Awnletted

4 = Awned

12. GLUMES: (At Maturity)

A. COLOR

1 = White

2 = Tan

3 = Other (Specify)

B. SHOULDER

1 = Wanting

2 = Oblique

3 = Rounded

4 = Square

5 = Elevated

6 = Apiculate

7 = Other (Specify)

C. SHOULDER WIDTH

1 = Narrow

2 = Medium

3 = Wide

D. BEAK

1 = Obtuse

2 = Acute

3 = Acuminate

E. BEAK WIDTH

1 = Narrow

2 = Medium

3 = Wide

F. GLUME LENGTH

1 = Short (ca. 7mm)

2 = Medium (ca. 8mm)

3 = Long (ca. 9mm)

G. WIDTH

1 = Narrow (ca. 3mm)

2 = Medium (ca. 3.5mm)

3 = Long (ca. 4mm)

13. SEED:

A. SHAPE

- ☐ 1 = Ovate
☐ 2 = Oval
☐ 3 = Elliptical

B. CHEEK

- ☐ 1 = Rounded
☐ 2 = Angular

C. BRUSH

- ☐ 1 = Short
☐ 2 = Medium
☐ 3 = Long
- 1 = Not Collared
 2 = Collared

D. CREASE

- ☐ 1 = Width 60% or less of Kernel
☐ 2 = Width 80% or less of Kernel
☐ 3 = Width Nearly as Wide as Kernel
- ☐ 1 = Depth 20% or less of Kernel
☐ 2 = Depth 35% or less of Kernel
☐ 3 = Depth 50% or less of Kernel

E. COLOR

- ☐ 1 = White
☐ 2 = Amber
☐ 3 = Red
☐ 4 = Other (Specify) _____

F. TEXTURE

- ☐ 1 = Hard
☐ 2 = Soft
☐ 3 = Other (Specify) _____

G. PHENOL REACTION (See Instructions)

- ☐ 1 = Ivory
☐ 2 = Fawn
☐ 3 = Light Brown
☐ 4 = Dark Brown
☐ 5 = Black

H. SEED WEIGHT

- ☐ 36 g/1000 Seed (Whole number only)

I. GERM SIZE

- ☐ 1 = Small
☐ 2 = Midsize
☐ 3 = Large

14. DISEASE: PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

(0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

- | | |
|---|---|
| <input type="checkbox"/> Stem Rust (<i>Puccinia graminis</i> f. sp. <i>tritici</i>) | <input type="checkbox"/> Leaf Rust (<i>Puccinia recondita</i> f. sp. <i>tritici</i>) |
| <input type="checkbox"/> Stripe Rust (<i>Puccinia striiformis</i>) | <input type="checkbox"/> Loose Smut (<i>Ustilago tritici</i>) |
| <input type="checkbox"/> Tan Spot (<i>Pyrenophora tritici-repentis</i>) | <input type="checkbox"/> Flag Smut (<i>Urocystis agropyri</i>) |
| <input type="checkbox"/> Halo Spot (<i>Selenophoma donacis</i>) | <input type="checkbox"/> Common Bunt (<i>Tilletia tritici</i> or <i>T. laevis</i>) |
| <input type="checkbox"/> Septoria nodorum (Glume Blotch) | <input type="checkbox"/> Dwarf Bunt (<i>Tilletia controversa</i>) |
| <input type="checkbox"/> Septoria avenae (Speckled Leaf Disease) | <input type="checkbox"/> Karnal Bunt (<i>Tilletia indica</i>) |
| <input type="checkbox"/> Septoria tritici (Speckled Leaf Blotch) | <input type="checkbox"/> Powdery Mildew (<i>Erysiphe graminis</i> f. sp. <i>tritici</i>) |
| <input type="checkbox"/> Scab (<i>Fusarium</i> spp.) | <input type="checkbox"/> "Snow Molds" |
| <input type="checkbox"/> "Black Point" (Kernel Smudge) | <input type="checkbox"/> Common Root Rot (<i>Fusarium</i> , <i>Cochliobolus</i> and <i>Bipolaris</i> spp.) |
| <input type="checkbox"/> Barley Yellow Dwarf Virus (BYDV) | <input type="checkbox"/> Rhizoctonia Root Rot (<i>Rhizoctonia solani</i>) |
| <input type="checkbox"/> Soilborne Mosaic Virus (SBMV) | <input type="checkbox"/> Black Chaff (<i>Xanthomonas campestris</i> pv. <i>translucens</i>) |
| <input type="checkbox"/> Wheat Yellow (Spindle Streak) Mosaic Virus | <input type="checkbox"/> Bacterial Leaf Blight (<i>Pseudomonas syringae</i> pv. <i>syringae</i>) |
| <input type="checkbox"/> Wheat Streak Mosaic Virus (WSMV) | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Other (Specify) _____ | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Other (Specify) _____ | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Other (Specify) _____ | <input type="checkbox"/> Other (Specify) _____ |

15. INSECT: (0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

- | | |
|--|--|
| <input type="checkbox"/> Hessian Fly (<i>Mayetiola destructor</i>) | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Stem Sawfly (<i>Cephus</i> spp.) | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Cereal Leaf Beetle (<i>Oulema melanopa</i>) | <input type="checkbox"/> Other (Specify) _____ |

15. INSECT: (continued) 0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Intermediate 4 = Tolerant

200600005 Exhibit C (Wheat)

PLEASE SPECIFY BIOTYPE (Where Needed)

☒ Russian Aphid (*Diuraphis noxia*)

☒ Greenbug (*Schizaphis graminum*)

☒ Aphids

☐ Other (Specify) _____






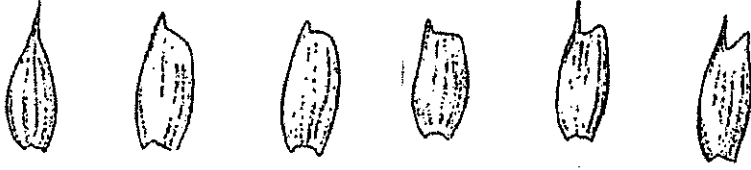

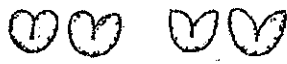
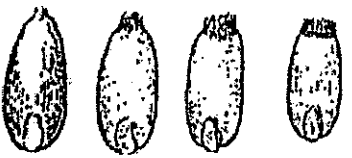
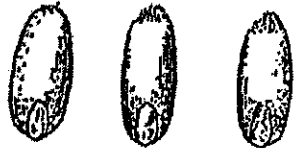



☐ Other (Specify) _____

☐ Other (Specify) _____

16. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS:

Section Numbers Correspond to the Numbers of the Sections on the Form

200600005

| | | | |
|--|---|--|--|
| <p>4. EARLY PLANT GROWTH HABIT:</p>  <p>1 Prostrate 2 Intermediate 3 Erect</p> | <p>10. STEM INTERNODE X-SECTION:</p>  <p>1 Hollow 2 Semi-solid 3 Solid</p> | <p>11. SPIKE SHAPE:</p>  <p>1 Tapering 2 Oblong 3 Clavate 4 Elliptical</p> | |
| <p>11. AWNEDNESS:</p>  <p>1 Awnless 2 Apically Awnleted 3 Awnleted 4 Awned</p> | <p>12. BEAK SHAPE:</p>  <p>1 Obtuse 2 Acute 3 Acuminate</p> | | |
| <p>12. SHOULDER SHAPE:</p>  <p>1 Wanting 2 Oblique 3 Rounded 4 Square 5 Elevated 6 Apiculate</p> | | | |
| <p>13. SEED SHAPE:</p>  <p>1 Ovate 2 Oval 3 Elliptical</p> | <p>13. CHEEK SHAPE:</p>  <p>1 Rounded 2 Angular</p> | <p>13. BRUSH SIZE:</p>  <p>1 Small 2 Midsized 3 Large 4 Collared</p> | <p>13. BRUSH HAIR LENGTH:</p>  <p>1 Short 2 Medium 3 Long</p> |
| <p>13. GERM (EMBRYO) SIZE:</p>  <p>1 Small 2 Midsized 3 Large</p> | <p>13. SEED CREASE WIDTH:</p>  <p>1 Narrow 2 Mid-wide 3 Wide</p> | <p>13. SEED CREASE DEPTH:</p>  <p>1 Shallow 2 Mid-Deep 3 Deep</p> | |

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200600005

EXHIBIT D. End-use (milling and baking) quality data for 'Penawawa-X' 'Waxy-Pen' MAH
5/18/06
in support of PVP Application No. 200600005, Wheat, Common; 5 May 2006

Table 1. Quality data[‡] from the 2005 Western Regional Soft White Spring Wheat Nursery, Penawawa-X compared to Alpowa Soft White Spring Wheat Variety

| Variety | Test Weight (lbs/bu) | SKCS [†] Hardness | Kernel Weight (mg) | Protein (%) | L-DOPA [‡] (Abs.) | Flour Yield (%) | Break Flour Yield (%) | Milling Score |
|------------|----------------------|----------------------------|--------------------|-------------|----------------------------|-----------------|-----------------------|---------------|
| Alpowa | 60.8 | 26.9 | 28.9 | 13.1 | 0.777 | 65.7 | 50.3 | 77.4 |
| Penawawa-X | 58.2 | 31.7 | 23.3 | 13.4 | 0.865 | 58.9 | 44.9 | 63.0 |

| Variety | Flour Ash (%) | Flour Protein (%) | Flour Swelling Volume (mL) | Flour SDS [§] Sedimentation (mL/g) | Mixograph Water Absorption (%) | Rapid Visco Analyzer (cP/10) |
|------------|---------------|-------------------|----------------------------|---|--------------------------------|------------------------------|
| Alpowa | 0.43 | 11.2 | 23.7 | 172.3 | 58.0 | 179 |
| Penawawa-X | 0.52 | 11.8 | 26.8 | 212.9 | 61.9 | 97 |

| Variety | Solvent Retention Capacity | | | Cookie Diameter (cm) | Sponge Cake Volume (CC) | Falling Number (sec) |
|------------|----------------------------|-----------|-------------|----------------------|-------------------------|----------------------|
| | Carbonate (%) | Water (%) | Sucrose (%) | | | |
| Alpowa | 81.5 | 56.8 | 105.3 | 9.09 | 1255 | 450 |
| Penawawa-X | 117.0 | 72.5 | 148.0 | 8.02 | 855 | 67 |

[‡] All data were obtained from the USDA ARS Western Wheat Quality Laboratory using standard testing procedures

[†] SKCS = Single Kernel Characterization System

[‡] L-DOPA = 3,4-dihydroxy-L-phenylalanine (Polyphenol oxidase assay)

[§] SDS = Sodium dodecylsulfate

200600005

Table 2. Quality data[†] from the 2005 Washington State University Soft White Spring Wheat Variety Testing Nurseries, Penawawa-X compared to Alpowa Soft White Spring Wheat Variety

WAXY-PEN

MAH
5/18/06

| Variety | Test Weight (lbs/bu) | SKCS [†] Hardness | Kernel Weight (mg) | Protein (%) | L-DOPA [‡] (Abs.) | Flour Yield (%) | Break Flour Yield (%) | Milling Score |
|------------|----------------------|----------------------------|--------------------|-------------|----------------------------|-----------------|-----------------------|---------------|
| Alpowa | 62.5 | 34.1 | 31.0 | 12.4 | 1.17 | 66.1 | 50.5 | 78.9 |
| Penawawa-X | 59.6 | 36.3 | 25.5 | 12.8 | 1.12 | 61.0 | 49.0 | 65.6 |

| Variety | Flour Ash (%) | Flour Protein (%) | Flour Swelling Volume (mL) | Flour SDS [§] Sedimentation (mL/g) | Mixograph Water Absorption (%) | Cookie Diameter (cm) |
|------------|---------------|-------------------|----------------------------|---|--------------------------------|----------------------|
| Alpowa | 0.41 | 10.9 | 19.9 | 163.0 | 55.8 | 9.18 |
| Penawawa-X | 0.52 | 11.6 | 26.5 | 160.1 | 62.5 | 7.72 |

Solvent Retention Capacity

| Variety | Carbonate (%) | Water (%) | Sucrose (%) |
|------------|---------------|-----------|-------------|
| Alpowa | 78.9 | 56.3 | 106.3 |
| Penawawa-X | 116.6 | 72.3 | 150.5 |

[†] All data were obtained from the USDA ARS Western Wheat Quality Laboratory using standard testing procedures

[†] SKCS = Single Kernel Characterization System

[‡] L-DOPA = 3,4-dihydroxy-L-phenylalanine (Polyphenol oxidase assay)

[§] SDS = Sodium dodecylsulfate

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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE**EXHIBIT E**
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

| | | |
|---|---|--|
| 1. NAME OF APPLICANT(S) US Government represented by the Secretary of Agriculture | 2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER WA7996 WQL7PENWX-2 | 3. VARIETY NAME Penawawa-X 'Waxy-Pen' 1744 5/18/06 |
| 4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) USDA-ARS, Wheat Quality Lab E-202 Food Quality Bldg. WSU PO Box 646394 Pullman, WA 99164-6394 | 5. TELEPHONE (Include area code) (509) 335-4062 | 6. FAX (Include area code) (509) 335-8537 |
| 7. PVPO NUMBER 200600005 | | |

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain. ☒ YES ☐ NO9. Is the applicant (individual or company) a U.S. national or a U.S. based company? If no, give name of country. ☐ YES ☐ NO
NA10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?

☐ YES ☐ NO If no, give name of country

NA

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?

☐ YES ☐ NO If no, give name of country

NA

11. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

Penawawa-X was bred by Dr. Craig F. Morris, an employee of the USDA-ARS. Dr. Morris' rights have been assigned to the US Department of Agriculture as represented by the Secretary of Agriculture.

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.